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ABSTRACT

In partnership with the Memorial University of Newfoundland, the Vista School District, 1 of 10 districts in Newfoundland, Canada, established the Vista School District Digital Intranet (VSDDI) to deliver Web-based advanced placement courses to rural students. Advanced placement mathematics, physics, biology, and chemistry courses are delivered via a district digital intranet that connects all district senior high schools and the Memorial University of Newfoundland. Each participating school has a school intranet linked to a satellite dish that provides access to the VSDDI intranet and the Internet. Instruction includes both synchronous and asynchronous components. Synchronous instruction allows students in multiple, rural schools to communicate in real time with each other and with their instructor, using whiteboards, chat, video, and voice communication. The asynchronous component provides student access to lessons, a bulletin board, private email, a calendar, tests, presentations, individual evaluation records, and a software package that allows students and instructors in separate schools and different times to take part in a virtual classroom discussion. As of September 1999, the program has been expanded to 5 of the 10 school districts in Newfoundland. The URL is included. (TD)

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Vista School District Digital Intranet: The Delivery of Advanced Placement Courses to Young Adult Learners in Rural Communities

Authors: David Power, Dr. Ken Stevens, Wilbert Boone, Maurice Barry

Background:

The province of Newfoundland and Labrador in Atlantic Canada is characterized by its geographic isolation, its many rural communities, its distinctive history and culture, its high unemployment and, for educators, the different outcomes between rural and urban schools. In the 1996-97 school year, there were 462 schools operating in the province of which 309, or 66.9%, were located in rural communities. The number of students enrolled in these rural schools was 50,378 or 47.4% of the student population. The recent re-organization of K-12 education in Newfoundland and Labrador into ten school districts provides an opportunity to develop the first digital intranet in the province. The Vista School District contains 18 schools ranging in student enrolment from 650 down to 40. The region in which the Vista School District is located extends from Bonavista in the north, (the place where John Cabot landed in North America in 1497) to the Burin Peninsula in the South. It is a large geographic area covering about 7000 square kilometres. The region has a population of about 35,000 people and an economy supported by a diverse infrastructure including fishing, forestry, farming, mining, aquaculture and tourism. The Vista School District was formed in 1996 and became a legal entity in January 1997. There are 5165 students enrolled in 18 schools in the district who are taught by 366 teachers. The Vista School District is approximately two hours by road from the capital city, St Johns, which is the location of Memorial University of Newfoundland.

On March 26, 1998, the Vista School District held an 'Official Launch' of it's five-year STRATEGIC PLAN, 1997-2002. One of the goals stated that Vista School District will "Increase Student and Staff Understanding and Use of Technology". The strategic objective states: By 2002, technology will be incorporated and used to maximize the effectiveness of student learning, instructional management, staff development, and administration. The STRATEGIC PLAN included a number of strategies to facilitate the achievement of the strategic objective stated above, such as:

- We will evaluate the effectiveness of current distance education activities and explore new models for serving all students.
- We will develop a District Intranet that will be used to support staff development and other activities.
- We will explore through the use of technology the development of independent study activities and courses for students.
- We will expand distance learning opportunities for students enabling them to pursue individual curriculum opportunities and interests.

A Senior High School Report entitled **The Senior High School Program: New Directions for the 21st Century** was released by the Department of Education in June 1997. This report endorsed the Advanced Placement Program as an integral component of the senior high school program for high achieving students; however, the majority of rural schools in Newfoundland and Labrador are unable to offer the Advanced Placement courses due to low enrolments.

Research and Development of Web-based Courses:

Vista School District in partnership with the Centre for TeleLearning and Rural Education in the Faculty of Education, Memorial University of Newfoundland, and STEM~Net began participating in a research and development initiative, known as the **Vista School District Digital Intranet: The Delivery of Advanced Placement Courses to Young Adult Learners in Rural Communities**. This initiative is also endorsed by the Program Development Division of the Department of Education.

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The Centre for TeleLearning and Rural Education in partnership with the Vista School District began to research and develop four Web-based Advanced Placement courses: Mathematics 4225, Physics 4224, Biology 4221, and Chemistry 4222 for delivery to young adult learners in rural communities using a school district digital intranet. As a result of financial assistance from SchoolNet/Industry Canada, the Centre for TeleLearning and Rural Education in collaboration with the Vista School District, STEM~Net and the School of Continuing Education at Memorial University of Newfoundland, an Instructional Design and Development Team was established. The Team consisted of four Content Specialists (Mathematics, Physics, Biology and Chemistry); an Instructional Design Specialist; and four Student Assistants.

The Centre for TeleLearning and Rural Education began the process of establishing a Multimedia Research and Development Laboratory to enable the research and development of the four Web-based courses. A multimedia workstation with related peripherals was purchased with financial assistance provided by the Canadian publishing industry; in particular, Addison Wesley Longman, ITP Nelson and Prentice Hall Ginn Canada. In addition, four multimedia workstations were purchased for developing the Web-based courses with financial assistance from the Canada-Newfoundland COOPERATION Agreement on Human Resource Development, administrated by the Atlantic Canada Opportunities Agency and the Department of Education.

Vista School District completed an extensive pilot in the 1998-99 school year involving a significant number of students in their graduating year. Mathematics 4225 was delivered from Musgravetown Central High School, Musgravetown; Biology 4221 was delivered from Clarenville High School, Clarenville; Chemistry 4222 was delivered from Discovery Collegiate, Bonavista; and Physics 4224 was delivered from the Centre for TeleLearning and Rural Education, Faculty of Education. As a result of this ongoing initiative, young adult learners within the Vista School District have improved educational opportunities in Mathematics and Science. As well, the transition to post-secondary institutions such as Memorial University of Newfoundland and the College of the North Atlantic has been enhanced.

Course Delivery:

To facilitate the delivery of Mathematics 4225, Physics 4224, Biology 4221 and Chemistry 4222, Vista School District, in partnership with STEM~Net, established the Vista School District Digital Intranet that links all schools under the jurisdiction of the Vista School District that are offering a senior high school program including the Centre for TeleLearning and Rural Education in the Faculty of Education. Furthermore, these schools have been provided with a DirecPC satellite dish as a result of a partnership between Vista School District, STEM~Net/SchoolNet/ Industry Canada, and NewTel Communications Inc. In addition, financial assistance was also provided to STEM~Net for the purchase of some of the DirecPC satellite dishes under the Canada-Newfoundland COOPERATION Agreement on Human Resource Development.

All schools participating in the Vista School District Digital Intranet: The Delivery of Advanced Placement Courses to Young Adult Learners in Rural Communities have a school Intranet using WindowsNT that have been linked to a DirecPC satellite dish. These DirecPC satellite dishes provide greater bandwidth (i.e., down-link) for students and teachers to access the Vista School District Digital Intranet, STEM~Net/SchoolNet, the World Wide Web and the Internet in rural communities.

This research and development project is an extension of research being conducted through the TeleLearning Network of Centres of Excellence that involves Clarenville High School and the Centre for TeleLearning and Rural Education in the Faculty of Education, Memorial University of Newfoundland. Specifically, Theme 4: K-12 Knowledge-building Communities; in particular, Theme 4.3- Using emergent technologies to teach senior high school mathematics and science.

Dr. Ken Stevens, Chair of TeleLearning and Rural Education in the Faculty of Education, and Principal Investigator with TL-NCE, is researching the pedagogical implications of Web-based course delivery to senior high school students in rural communities as well as conducting an external evaluation of all aspects of the Vista School District Digital Intranet: The Delivery of Advanced Placement Courses to Young Adult Learners in Rural Communities. The evaluation framework includes: administrative,

curriculum, instructional, and technological components. This research and development initiative has national and international potential since the curriculum for the Advanced Placement Program developed by the College Entrance Examination Board in the United States has international recognition. As of September 1999, the delivery of advanced placement instruction via the digital intranet has expanded to 5 of the 10 school districts in Newfoundland and Labrador. Research and development continue.

Components of Instruction:

Instruction includes both synchronous and asynchronous components. Synchronous instruction is accomplished through the use of Microsoft Netmeeting and MeetingPoint. This combination of software allows students in multiple, rural schools to communicate in real time with each other and with their instructor. Students and instructor are able to share applications, make use of whiteboard, chat, video, and voice communication. At present, technical limitations tend to restrict the use of this combination of software to the morning sessions of the school day.

Asynchronous delivery of instructional resources makes use of two **very impressive** software packages, **WebCT** and **Knowledge Forum**. WebCT provides student access to all asynchronous course resources including:

- **Lessons:** Provides complete course outline, lesson notes, homework, assignments, and labs (Physics, Chemistry and Biology).
- **Bulletin Board:** Enables public communication between students and instructor.
- **Private E-mail:** Allows students to communicate privately with their "virtual classmates" and their instructor.
- **Calendar:** Outlines daily activities, labs, lessons, assignment due dates, and general reminders.
- **Tests (Quizzes):** Provides for student self-evaluation. Evaluation items may include matching, multiple choice, short answer, and essay type questions which may include supporting graphics.
- **Presentations:** Used for creation of individual student web pages.
- **My Record:** Allows students private access to their evaluation records.
- **Knowledge Forum:** Knowledge Forum is a separate software package. The icon has been placed on the WebCT Welcome Page to facilitate student access.

During the pilot year (1998-1999), because students were unsupervised during asynchronous times, many of the students used their asynchronous class time to complete homework for other courses. As of September 1999, **Knowledge Forum** has proved to be an **especially impressive** addition to the resources used in the knowledge-building process, and the development of the **virtual classroom**. Knowledge Forum enables students and their instructor, located in separate schools, at different times, to take part in what might be described as a "virtual classroom discussion." For students in an unsupervised class, using KF has provided an **important advantage** since it allows the instructor to monitor, and more importantly, be a part of the activities of students who are neither physically present in the same building, nor present at the same time. Since the implementation of KF, **both student management and knowledge building have improved.**

Readers who wish to view any of the AP sites are welcome. To access, use the following URL:

http://www.stemnet.nf.ca/~vsddi/index.html

When asked for login information, use user name = Student (note the capital S) and password = education (all lower case). To access Knowledge Forum from the main menu, use the same user name and password.

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